PROJECT NUMBER : 2108
PROJECT TITLE : New Product and Filter Technology
PROJECT LEADER : W. T. Callaham
PERIOD COVERED : February, 1991

I. FILTER WEB DEVELOPMENT

A. **Objective:** To characterize web-type filter materials and develop subjectively acceptable products with them.

B. **Status:** Filter efficiency of web filters produced with PM web produced on January 3 at James River Neenah Technical Center (JR-NTC) showed removal efficiencies equivalent to the October and November JR-NTC runs and to Tela paper.

PM web samples made on January 28 at JR-NTC were evaluated for rodmaking characteristics. Courtaulds staple web was found to have a shorter capability range, higher rod RTD, and equal variation when compared to Celanese. Celanese material produced with and without crepe showed the uncreped material to have higher rod weight, lower RTD values, and shorter capability range. All samples ran well at medium corrugation but exhibited substantial dusting problems. In general, the Celanese material performed as well as previous Celco-Narrows materials. Filter efficiency data comparing Courtaulds staple web to Celanese staple web showed equal efficiency at same RTD. Efficiencies were similar to previous webs made at James River.

Web samples from February 16, 1991, trials at JR-NTC were evaluated for dusting during rodmaking. Models with insoluble PVOH were unimproved over previous webs. Static electricity in these webs was also substantial. Materials were slit to 5.5 inches and forwarded to American Filtrona for sample filter production.

A Trim KDF2 garniture was ordered from York to evaluate paper filters at 6mm diameter. Filter making trials with Tela paper at a 6mm filter diameter indicated significantly greater RTD capability than American Filtrona at lower variability. This information will be delivered to AF to drive their process improvement efforts.

II. MACHINERY DEVELOPMENT

A. **Objective:** Develop or modify manufacturing equipment to support Product Development efforts.

B. **Status:**

Strip Application Unit: Adhesive evaluations are ongoing on the Strip Application Unit (SAU). Non-uniformity of adhesive application has required several machine

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adjustments to be made. Group personnel along with Engineering have evaluated the problems and short and longer lead time modifications to the SAU have been suggested.

The application of adhesives in various patterns is being explored as an alternative to the application of paper strips. Quotes have been received from Inta Roto and Jewett Automation to provide glue rollers with patterns.

Coating Equipment: Alliance Machine submitted a quote for design and fabrication of a 12 inch wide coater as specified by PM. A conceptual drawing of Kimberly Clark's proposed new coater was obtained and evaluated for comparison to the PM specifications. This design appears to have fewer features than were originally proposed for the PM coater. The PM specifications were also transmitted to Fox Valley Ltd., the designer/fabricator of the KC machine. This quotation is currently being reviewed versus the Alliance quotation.

The R&D machine shop has completed fabrication of a bracket to hold the Nordson slot nozzle and installation is proceeding.

III. NOVEL FILTERS AND FILTER MATERIALS

A. Objective: To investigate novel filters or filter materials for potential applications where increased efficiency, taste response or a novelty is needed.

B. Status: Sample filters using Tela paper, CA web, and Celanese PM web core materials were obtained from American Filtrona for testing of alternate BOLD 100s designs. Samples using triethyl citrate on tow with Tela core material were also obtained.

PVA and hot melt adhesive samples used by American Filtrona (AF) for concentric filter making were subjectively evaluated by Flavor Technology and the Richmond Panel. The hotmelt was rejected for off-taste and a new hotmelt is being forwarded for trial. Samples were also sent to Analytical Research Division for testing.

48 trays of 98mm paper core concentric filter rods were received from American Filtrona to support additional Product Development testing.

Development of disposable dual Cambridge pad holders for measuring peripheral and core deliveries in concentric filters is ongoing. Die design changes by the vendor have been successful in improving the fit between the different holder components. Further refinements are in progress to improve the smoothness of the interior surfaces of the pad holder.

IV. ALTERNATIVE PLASTICIZERS

A. Objective: Qualify alternative plasticizers which offer a product advantage.

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B. Status: A preliminary disclosure was written for consideration of patentability of triethyl citrate plasticizer and the enhanced menthol delivery observed using TEC plasticizer.

V. CARBON STUDIES

A. Objective: Conduct fundamental studies of carbons and carbon filtered cigarettes to better understand their performance.

B. Status: Materials for the production of combined filter rods on a Hauni High-Speed plug-space-plug combiner were ordered and delivered to Hauni Hamburg for a trial during the week of April 22.

A test to verify the mean and variation levels of our existing carbons was designed. The test design provides for the characterizing of carbons on a "standard" sieve screen distribution and for the correlation of PM and Calgon/Pica measurement systems. Resulting information will be used to establish carbon specifications.

A second set of samples was submitted to Flavor Technology for GC headspace analyses. The analyses will determine differences in the amounts of anethole, propylene glycol, and other tobacco components as a function of the filter with/without activated carbon.

Ten drums of SCCW carbon without iron and zinc additives were received from Calgon. Samples were taken from each drum for CCl_4 activity, moisture, sieve size, and hardness measurements.

A TGA method was developed that gives the percent freon adsorbed on dried carbon at 25°C. Envirotrol will measure the CCl_4 activity of the carbon being used to develop a correlation.

Carbon fiber samples were received from Ashland Carbon Fibers and forwarded to Envirotrol for activity determination. Samples include 1/4" staple, mill carbon fiber, and two carbon fiber sheet samples. Filter rods will be produced with the carbon fiber sheet samples.

VI. MENTHOL TECHNOLOGY

A. Objective: To develop alternative mentholation techniques which offer a product advantage.

B. Status: MF Lights were made with Eastman menthol-in-dope filters with/without plasticizer and packed with/without mentholated foil to study menthol stability during aging. Initial smoking data on fresh samples indicate that the models with plasticizer delivered more menthol than the models without PZ. After two weeks aging in desert conditions, models with no plasticizer exhibit less menthol migration from the filter than those with plasticizer. At the same time, the models without plasticizer aged for two weeks in desert conditions delivered equal or more menthol than those

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stored in lab conditions. Storage in desert conditions for five days reduced menthol delivery by about 28% for models made with plasticizer and packed in mentholated foil.

MF Lights made with CA and CA/paper filters with two additive levels (4.44% and 7.98% of a PPG/TA/levulinic acid mixture) were subjectively smoked. The CA/paper model with the higher additive level was more similar to the control, but the test model with the lower additive level was judged higher in cooling than the other two models which is consistent with the analytical smoking data. Cigarettes were submitted to Flavor Technology after five weeks of aging in lab conditions.

Two test rolls of aluminum foil with special surface treatment from Reynolds Metals were mentholated at the request of Operation Services. The rolls ran well during menthol application and have been taken to Louisville for evaluation of menthol level and machinability on the packer.

VII. PRODUCT DEVELOPMENT SUPPORT

A. Objective: To provide cigarette/filter design, modelling and testing support for major new product development programs.

B. Status:

Lark: Meetings were held with Kimberly-Clark and Ecusta personnel and plans were developed for future porous combining wrap models.

Half-Nic: The Half-Nic smoking panel completed subjective evaluations of machine made cigarettes with a carbon on tow/CA dual filter. This filtration system was perceived to reduce some of the chemical off taste associated with ART cigarettes, however there was also a reduction in tobacco taste. This filtration system will be re-evaluated once the new totally extracted blend system has been designed by Leaf Department.

Machine made cigarettes have been produced using carbon-on-tow and Bold type filtration systems. We are awaiting CI data. Hand made cigarettes with triple filter designs have been subjectively evaluated. Several models show some promise and further testing is indicated.

VIII. NEW PACKAGING CONCEPTS

A. Objective: Develop or evaluate new packaging concepts which may offer a product advantage.

B. Status: The usage testing by PED was halted to address pack failures incurred during opening. Design changes are in progress and materials are being prepared for further testing.

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The ICI Americas co-polymer biodegradable powders used for film packaging were received. Samples of the powders will be sent to the Chemical Research Group for analysis.

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